**IN THE UNITED STATES DISTRICT COURT**
**FOR THE NORTHERN DISTRICT OF OKLAHOMA**

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| **STATE OF OKLAHOMA,** | : | |
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| **Plaintiff,** | : | |
| | : | |
| **v.** | : | **Case No. 4:05-CV-329-GKF-PJC** |
| | : | |
| **TYSON FOODS, INC., *et al.*,** | : | |
| | : | |
| **Defendants.** | : | |

**STATE OF OKLAHOMA'S RESPONSE TO DEFENDANTS' MOTION TO EXCLUDE TESTIMONY OF STRATUS CONSULTING EXPERTS UNDER F.R.E. 702 [DKT #2272]**

# TABLE OF CONTENTS

# TABLE OF AUTHORITIES

**Federal Rules**



**Other References**

The State of Oklahoma ("the State") submits this opposition to Defendants' Motion to Exclude Testimony of the Stratus Experts Under F.R.E. 702 [Dkt. #2272] ("Motion").

## I. INTRODUCTION

Defendants move to exclude any testimony of the "Stratus experts," the State's seven-member team of internationally recognized experts in environmental economics, natural resource damage assessments ("NRDA"), and survey methodology, led by Stratus Consulting ("the Stratus team").[1] Defendants challenge the contingent valuation methodology ("CV") in general and the State's application of CV in particular.

CV is a well-established, survey-based economic methodology commonly used to measure use and non-use values for a wide variety of goods and services, including public goods without readily determinable market values, such as water quality. The methodology, introduced over 60 years ago and refined over the past 40-plus years, has been endorsed by several federal agencies, including the Department of Interior ("DOI") and the National Oceanic and Atmospheric Administration ("NOAA"). Moreover, an expert panel commissioned by NOAA over 15 years ago to evaluate the reliability of CV and co-chaired by two Nobel laureates in economics concluded at that time that CV could produce reliable damage estimates for use in a judicial determination. (Ex. F, NOAA Report at 43.) There have since been improvements in CV, and as shown below, it satisfies *Daubert* and the Federal Rules of Evidence.

In the present case, the State used CV to measure the monetary value placed on aesthetic and ecosystem injuries to the Illinois River system and Tenkiller Lake ("river and lake") due to excessive phosphorus. (*See* Dkt. #1853-5, CV Report, p. ES-1.) The State's CV Study was

[1] Defendants do not challenge the expertise of any of the Stratus experts. Their curriculum vitas are provided as follows: Bishop (Ex. A); Chapman (Ex. B); Hanemann (Dkt. #2242-12); Kanninen (Ex. C); Krosnick (Ex. D); Morey (Ex. E); Tourangeau (Dkt. #2242-13).

professionally designed, carefully pretested, and analyzed using conservative techniques. *See* State's expert report entitled "Natural Resource Damages Associated with Aesthetic and Ecosystem Injuries to Oklahoma's Illinois River System and Tenkiller Lake" ("CV Report").

## II. FACTUAL BACKGROUND

### A. Background to Contingent Valuation Methodology

The CV methodology uses well-developed survey techniques to ascertain values for goods and services for which there is no market (or for which market data provides an incomplete measure of value). Broadly speaking, a constructed market is established for a specific good to assist individuals in making a tradeoff that reveals the value they place on the good. The values associated with the use of the resource (e.g., swimming) are generally referred to as "use" values; the other values are generally referred to as "non-use" or "passive use" values. CV is designed to measure both use and non-use values, providing a "total valuation."

CV was first proposed in the 1940s for the evaluation of public programs *not* provided through the marketplace. H.R. Bowen, *The Interpretation of Voting in the Allocation of Economic Resources*, Quarterly Journal of Economics 58(4):27-48 (1943). The first published CV study was issued over 45 years ago.[2] R.K. Davis, *Recreational Planning as an Economics Problem*, 3 Natural Resources Journal (1963). (*See also* Dkt. #1853-5, CV Report, p. 1-6 (identifying other early studies).) Since 1963, over 6,000 papers on CV have been published in the United States and abroad, many of which appear in the peer-reviewed economics literature. (Dkt. #1853-5, CV Report, p. ES-1.) According to the DOI, "CV has become one of the most widely used methods of nonmarket valuation." 59 Fed. Reg. 23098, 23100-101 (May 4, 1994). The U.S. Office of Management and Budget ("OMB"), which oversees economic analyses

[2] CV was initially developed for use in benefit-cost analysis (whereby governmental programs and policies are evaluated *ex ante*) to better inform choices about net societal benefits.

throughout the federal government, explicitly authorizes the use of CV, and federal agencies extensively use it, including the EPA, USDA, DOI and NOAA, discussed *infra* Section II.B.[3] *See* U.S. OMB, Circular A-4, at 22, *available at* http://www.whitehouse.gov/omb/circulars /a004/a-4.pdf. When used primarily to assist governmental decision-making, CV engendered little controversy. Not surprisingly, however, with the enactment of statutory provisions allowing the public to recover natural resource damages ("NRD") (e.g., CERCLA, 42 U.S.C. § 9607(f)), CV became a target of industry interests.[4] (*See* Ex. F, NOAA Report at 4-5.)

### B. Contingent Valuation: Approval for Use by DOI and NOAA

#### *1. DOI*

When the initial set of NRDA regulations was issued in 1986, the DOI explicitly authorized the use of CV and included passive use values among recoverable losses. 43 C.F.R. §§ 11.83(d)(5)(i), (ii) (1987). In response to CV's skeptics, DOI stated that CV has "been tested and reviewed in many professional journals and under a wide variety of circumstances. ***When used correctly . . . these methodologies work well and are valid and appropriate measures for determining damages***." 51 Fed. Reg. 27674, 27720 (Aug. 1, 1986) (emphasis added); *see id.* at 27721 (CV is a "valid, proven technique when properly structured and professionally applied").

Soon thereafter, industry challenged DOI's adoption of CV in court. *Ohio v. U.S. Dep't of Interior*, 880 F.2d 432, 475 (D.C. Cir. 1989). That challenge was strikingly similar to Defendants' stance here, and it was flatly rejected by the court. *Id.* at 477-78. Specifically,

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[3] Other examples of governmental use: (1) President Clinton's Clean Water Initiative (March 1994) (Ex. P); (2) U.S. Army Corps of Engineers, *National Economic Development Procedures Manual-Recreation, A Guide for Using the Contingent Valuation Methodology in Recreation Studies* (March 1986) (Ex. Q).

[4] The "controversy" over CV heightened following the 1989 Exxon Valdez oil spill. When Exxon was sued for NRD, it funded research critical of CV and yielded papers by Drs. Desvousges, Hausman, and others. These papers, which were not peer-reviewed, were compiled in a book entitled "Contingent Valuation: A Critical Assessment," cited in Defendants' Motion.

industry petitioners argued that DOI's NRDA regulations are invalid to the extent that they authorize the use of CV for measuring option and existence (i.e., non-use) values. *Id.* at 476 n.77, 477. The court rejected this claim: "Option and existence values are non-consumptive values compensable under the terms of CERCLA."[5] *Id.* at 476; *see id.* at 464.

The court also rebuffed industry's contentions that CV was not a "best available procedure" because it is "rife with speculation," "is imprecise, is untested, and has a built-in bias and a propensity to produce overestimation." *Id.* at 476. Specifically, the court stated:

> DOI scrutinized a vast array of position papers and discussions addressing the use of CV. It recognized . . . that CV needs to be 'properly structured and professionally applied.' . . . We find DOI's promulgation of CV methodology reasonable and consistent with congressional intent, and therefore worthy of deference.

*Id.* at 476-77; *see id.* at 480.

***2. NOAA and the NOAA Panel***

During its own rulemaking, NOAA commissioned a panel of experts, including two Nobel laureates ("NOAA Panel"), to determine "whether the CV technique is capable of providing reliable information about lost existence or other passive-use values" in the NRDA context. (Ex. F, NOAA Report at 5.) The Panel accepted testimony from, among others, critics of CV, including Drs. Desvousges and Hausman, who offered the same arguments Defendants make here. (Ex. H, NOAA Panel Hrg. Tr., pp. 36, 37, 54, 56, 248, 250-52.) However, the Panel was unpersuaded and concluded that CV – if properly conducted under specific guidelines (*see infra* Section III.E.1) – produces "estimates reliable enough to be the starting point of a judicial process of damage assessment, including lost passive-use values." (Ex. F, NOAA Panel Report at 43.)

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[5] Even Defendants' expert Dr. Desvousges has acknowledged: "[T]here is a consensus among economists that nonuse values are a legitimate part of the total value of natural resource services." (Ex. G, pp. 3-12 to 3-13.)

Moreover, the NOAA Panel rejected the specific concerns raised by Defendants here. For example, it rejected the argument that non-use values were not appropriate for valuation. (*Id.*) The Panel acknowledged that for over twenty-five years, "economists have recognized the possibility that individuals who make no active use of a particular beach, river, bay, or other such natural resource might, nevertheless, derive satisfaction from its mere existence, even if they never intend to make active use of it." (*Id.* at 2.) The Panel also expressly concluded that CV is reliable and suitable for litigation, stating: "We think it is fair to describe such information as reliable by the standards that seem to be implicit in similar contexts, like market analysis for new and innovative products and ***the assessment of other damages normally allowed in court proceedings.***" (*Id.* at 43; *see also id.* at 44 ("a well-conducted CV study . . . contains information that judges and juries will wish to use, in combination with other evidence").)

After the NOAA Panel endorsed CV, NOAA authorized trustees to use CV to calculate NRD. 59 Fed. Reg. 1062, 1074, 1182-84 (Jan. 7, 1994); 61 Fed. Reg. 440, 453, 499 (Jan. 5, 1996). Despite the *Ohio* holding, various industry groups objected to NOAA's final rule, arguing that NOAA ignored the criticisms of CV. *General Elec. Co. v. U.S. Dep't of Comm.*, 128 F.3d 767, 771 (D.C. Cir. 1997). They also claimed that "NOAA acted arbitrarily and capriciously by failing to bar [CV] altogether." *Id.* at 773. The court quickly rejected these arguments, reasoning that nothing cast doubt on *Ohio*, and the NOAA Panel itself "found that if performed correctly, [CV] can produce both useful and reliable results." *Id.* at 773-74.

**C. The CV Study**

The State's CV Study, conducted over a more than two-year period, conformed to the NRDA framework presented in the DOI's NRDA regulations. (Dkt #1853-5, CV Report, p. ES-1, Ch. 3.) The Stratus team's CV survey underwent an extensive period of development,

evaluation, and review prior to being administered. Focus groups were convened on twenty separate dates with 441 participants. (*Id.*, Ch. 3.3.) Cognitive one-on-one interviews with 54 participants assessed their understanding of the questionnaire. (*Id.*, Ch. 3.4.) Four rounds of pre-testing involved 578 participants. (*Id.*, Ch. 3.5; *see also* FJC, Reference Manual on Scientific Evidence 248-49 (2d ed. 2000) (discussing value of pre-testing).) The survey was extensively refined to maximize respondent understanding of the survey and obtain reliable responses in a manner that satisfied the NOAA Guidelines. (Dkt. # 1853-5, p. 3-1.) Westat, the largest statistical survey research organization of its kind in the U.S., implemented the two pilot tests and the main and scope surveys.[6] (*Id.*, chs. 3.6 and 5.)

Like all CV surveys, the Oklahoma CV survey described a *problem* and a *solution*, and asked a *valuation question*. (*Id.*, pp. 1-7, 1-9.) The CV Report provides a measure of the monetary value placed on aesthetic and ecosystem injuries to the Illinois River system and Tenkiller Lake. The CV Study developed a conservative measure of these damages, by estimating the mean willingness-to-pay ("WTP") for a hypothetical alum treatment program that would return the flow of services from the Illinois River system and Tenkiller Lake to their 1960 condition 40 years sooner than without the program (hereinafter "the scenario").[7] (*Id.*, p. 1-9.) Respondents could vote to accelerate the improvement to the river and lake's aesthetic and ecosystem conditions and pay the tax or accept natural recovery and use their money for other purposes. (*Id.*, p. 1-7.)

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[6] Westat conducted the final in-person survey with a random sample of Oklahoma residents. (*Id.*, p. ES-1.) The target population was Oklahoma's adult household population. (*Id.*, p. 5-2.) The sampled area included the entire state, except for several western counties, which removed 3% of the population. (*Id.*, p. 5-3.) A total of 1,637 interviews were completed.[6] (*Id.*, p. 5-16.) The overall weighted response rate was roughly 52%. (*Id.*)

[7] The team calculated a conservative estimate of per household damages of $184.55. (*Id.*, p. ES-1.) Based on a total of 1,352,878 households in the study area, the CV Report sets forth a future damages estimate of $249,673,635. (*Id.*)

The Stratus team verified that the Study conformed to the NOAA Guidelines. They used appropriate statistical procedures and sensitivity analyses and found: "Considering the evidence from all the applicable tests, the study met the standard for validity." (*Id.*, p. 1-8.)

## III. ARGUMENT

### A. Evidence and Testimony Related To CV Is Admissible Under *Daubert*

#### *1. Defendants Falsely State That Every Federal Court To Consider CV Has Found It Unreliable and Unsuitable for Litigation*

Defendants claim that every federal court "that has addressed the issue has determined that [CV] is unreliable and unsuitable for litigation." (Defs.' Brf. at 5) This is false.

First, several federal cases have approved the use of CV. As discussed in detail *supra* in Section II.B.1, in *Ohio*, 880 F.2d at 474-78, the D.C. Circuit Court of Appeals expressly approved DOI's allowance of CV to measure NRD, rejecting many of the same complaints lodged here, including the notion that CV is unreliable in producing NRD estimates. Likewise, in the NOAA counterpart to *Ohio*, the same court expressly approved NOAA's use of CV, rejecting the argument that CV is unreliable. *General Elec. Co.*, 128 F.3d at 772-74 (discussed *supra* Section II.B.2). In addition, in *Montana v. ARCO*, No. CV-83-317 (D. Mont.), the State of Montana conducted a CV study designed to calculate the total values held by Montana residents for injured resources and calculated past and future damages. Defendant ARCO moved to exclude the CV study pursuant to *Daubert* and Rule 702, challenging CV as a methodology and Montana's application in particular. The court *denied* the motion. (Ex. R, 3/3/97 Order.)

Second, Defendants' citation to cases that they claim rejected CV as "unreliable and unsuitable for litigation" is grossly misleading. (*See* Defs.' Brf. at 5.) In fact, Defendants have cited *no* case in which a court held that CV is "unreliable and unsuitable for litigation."

In *Kelley ex rel. Michigan v. Kysor Indus. Corp.*, No. 5:91:CV:45, 1994 U.S. Dist.

LEXIS 21194, at *64 n.17 (W.D. Mich. Oct. 27, 1994), the district court denied defendant's summary judgment motion on the damages attributable to plaintiffs' method of valuing NRD. *Id.* at *61. Plaintiff sought to use a "'benefits transfer' theory to apply results from a different site that used [CV]" to the site at issue. *Id.* at *62-63. The court concluded it had "not been provided with sufficient factual information on the method to make a final factual determination," adding that "*in light of some positive information concerning the CVM method, it would be improper to weigh the evidence at this time.*" *Id.* at *64 (emphasis added). Thus, the court did *not* determine that CV is "unreliable and unsuitable for litigation."[8] (Defs.' Brf. at 5.)

Defendants also cite a one-page minute order from *United States v. Montrose Chem. Corp.*, No. 90-3122 (C.D. Cal. Apr. 17, 2000) (Dkt. #2272-9). In *Montrose*, although the district court granted "DDT Defendants' motion to exclude plaintiffs' [CV] report & testimony based thereon," it did so without comment. (*See id.*) In fact, the movants in *Montrose* expressly stated that "Defendants do not now address the methodological flaws in [CV] generally or in Plaintiffs' CV surveys in particular . . . ." (Ex. S, p. 11.) The movants challenged solely the survey's injury description and did not challenge the CV method. Thus, the court did *not*, as Defendants suggest, determine that CV is unreliable and unsuitable for litigation. (Defs.' Brf. at 5.)

Finally, Defendants' reliance on *Idaho v. Southern Refrigerated Transport, Inc.*, No. 88-1279, 1991 WL 22479, at *19 (D. Idaho Jan. 24, 1991), is misplaced. Following a spill of agricultural fungicide, the State of Idaho sought damages for the resulting fishkill. *Id.* at *18. Idaho attempted to measure, among other things, the existence value of the non-returning fish by applying values from a CV study performed outside the context of the litigation relating to a

[8] The parties settled prior to any further ruling on the reliability of CV. *See* D. Thompson, *Valuing the Environment: Courts' Struggles with Natural Resource Damages*, 32 Envtl. L. 57, 78 n.192 (Winter 2002) (confirming same).

different loss and a different location, not the case here. The court found that the resource sought to be measured in the CV study did not sufficiently transfer to the litigation because the CV study determined WTP values to double the runs of steelhead and salmon in the entire Columbia River Basin (of which the site at issue in the case was just one part). *Id.* at *18-19. In so finding, the court expressly stated it did not mean to suggest that the fish had no existence value.[9] *Id.* at *19. Thus, the court made a study-specific finding, and did not reject CV as unreliable.

***2. Defendants Misrepresent an Invalidated Regulation as Governing Law***

> Defendants next falsely represent that the NOAA and DOI regulations on CV:
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> state that '*estimation of option and existence values (i.e., 'nonuse') shall be used only if the authorized official determines that no use values can be determined.* 43 C.F.R. § 11.83(c)(2)(vii)(d). Stratus was aware of this regulatory restriction, but chose to ignore it.

(Defs.' Brf. at 6 (emphasis added); *id.* at 1 (claiming regulatory limit on CV for non-use values). Thus, Defendants would have the Court believe that there is a regulation applicable to the CV Study that Stratus "chose to ignore" – a regulation prohibiting the estimation of non-use values if use values can be determined. This is patently false. First, Defendants cite a regulation – 43 C.F.R. § 11.83(c)(2)(vii)(d) – that does not exist. The State assumes that Defendants are quoting language invalidated twenty years ago in *Ohio*, 880 F.2d at 464.[10] Specifically, the court held that DOI had erroneously construed CERCLA by promulgating 43 C.F.R. § 1l.83(b)(2) limiting

[9] In its quotation from this case, Defendants' selective omission of language leaves the false impression that *CV* was found to be "legally insufficient." (Defs.' Brf. at 5.)

[10] 43 C.F.R. § 11.83(c)(1)(iii) (formerly 43 C.F.R. § 11.83(b)(2)), as originally promulgated by DOI and reviewed in *Ohio*, provided: "Estimation of option and existence values shall be used only if the authorized official determines that no use values can be determined." *See* 59 Fed. Reg. 14262, 14285 (Mar. 25, 1994) (redesignating § 11.83(b)(2) as § 11.83(c)(1)(iii)). In October 2008, the regulation was officially amended to be in accordance with *Ohio* and eliminate the reference to limitation on estimating non-use values (i.e., the language Defendants rely on). *See* 73 Fed. Reg. 57259 (Oct. 2, 2008) (final rule). The amendment was described as a "technical correction[] to the CFR" because "[s]ome invalidated provisions from the 1986 rule were carried over in the 1994 revisions responding to the *Ohio v. Interior* decision." 73 Fed. Reg. at 57261; *id.* at 57264. Defendants are certainly aware of *Ohio*, as they cite it elsewhere.

the estimation of non-use values to where no use values could be determined. 880 F.2d at 464.

Second, Defendants claim that "Stratus was aware of this regulatory restriction, but chose to ignore it." (Defs.' Brf. at 6.) In support of this incredible statement, Defendants cite to Deposition Exhibit 5 from the deposition of David Chapman, the CV Study's project manager. Defendants fail to tell the Court that, when Mr. Chapman was asked about the (invalidated) regulation, he testified as follows:

> I note on the history of this, of course, that this section of the reg was invalidated by a court ruling, and recently last year they finally got around to updating their rules and took this section out. So at the time this was an irrelevant part of the rules.

(Ex. T, Chapman Dep. at 69:12-17.) Thus, while Mr. Chapman corrected Defendants' mistake, Defendants have chosen to perpetuate it.

### *3. Hypothetical Bias*

Defendants claim that a "key criticism of CV," a notion called "hypothetical bias" is well documented and that "most research find significant divergence between stated and actual behavior." (Defs.' Brf. at 8, citing Johnston (Defs.' Brf., Ex. L).) This assertion is wrong. Johnston reported the results of his own study showing a close match between valuation surveys results and actual votes on a subsequent referendum. He concluded his study showed "no statistical evidence of hypothetical bias." (Dkt. #2272-13, p. 470.)

Some studies have found that CV yielded higher values than the amounts of money that people actually paid. However, their methods of doing CV strayed from what the NOAA Panel recommended, and from what was done in the State's CV Study. Some of these studies involved making small donations or asking how much participants would hypothetically donate if given the opportunity. The rest involved buying inexpensive consumer items (e.g., coffee mugs) or asking how much the participants would hypothetically pay if given the opportunity. The participants in most of the studies were college students. The article cited by Defendants

(Johnston 2006) concludes that such studies do not reveal what happens when adults vote on a tax, as in the State's CV Study. All well designed studies that have used referendum-format CV to predict actual referenda have failed to show the existence of hypothetical bias. This includes the Johnston (2006) study cited by Defendants and other studies.[11] In sum, the literature on hypothetical bias supports using referenda as a strategy that is not affected by hypothetical bias.

### B. It Is Irrelevant To the Validity of the Survey That the Restoration Scenario in the Survey Is Hypothetical

Defendants' next argument – that the CV Study is flawed because "the proposed solution in the Stratus survey is fictional" (Defs.' Brf. at 10) – also fails because it is based on a false premise, namely, that the alum scenario in the survey must be practical, efficacious, without collateral impacts, and intended to be implemented by the State. (*Id.*) In this regard, Defendants mislead the Court in suggesting the economic tradeoff is intended to value an alum program when in fact the tradeoff is designed to value an improvement in water quality. (*Id.* at 13.) Defendants' premise is untenable as a matter of economics, CV, and survey methodology.

Defendants unsuccessfully raised this issue when they sought (for the second time) to strike the Stratus Reports in March 2009 based on the survey's use of the alum scenario. (Dkt. #1950.) In response, the State demonstrated, through deposition testimony and declarations from Drs. Hanemann and Tourangeau, that whether the State ultimately implements an alum program and whether alum ultimately would be an effective treatment is irrelevant to the validity of the CV Study, the responses thereto, and the resulting analysis. (Dkt. #1987, pp. 8-12.) The State's position is also set forth in its motion to exclude the Connolly et al. (2009) Report and accompanying declarations of Drs. Hanemann and Tourangeau. (Dkt. #2242, pp. 2-4, 17-25,

[11] E.g., Champ and Brown (1997); Mitchell and Carson (1998); Vossler and Kerkvliet (2003); and Vossler et al. (2003). The same was shown by Silver and Krosnick in "Predictive Accuracy of Pre-Election Surveys on Referenda," provided during discovery, whose analysis of pre-election polls found them to predict actual voting extremely well.

#2242-3, #2242-4.) The State incorporates by reference both discussions and supporting declarations. In short, Defendants' criticisms regarding the alum scenario are irrelevant.

Simply stated, it is standard practice in CV surveys to introduce counterfactual information designed to give respondents a plausible situation within which to consider tradeoffs involved in arriving at their WTP value; this is what CV does.[12] (Ex. F, NOAA Report, pp. 3-4 ("Typically, CV studies provide respondents with information about a hypothetical government program"); *General Elec. Co.*, 128 F.3d at 772; Kevin J. Boyle, *Contingent Valuation in Practice, in* A Primer on Nonmarket Valuation 111, 128-29 (Patricia A. Champ et al., eds. 2003).) For Defendants to challenge the CV survey on this basis is nonsensical.[13]

**C. The CV Survey's Description of the Injury in the IRW Is Accurate**

Defendants further claim that the CV survey did not accurately describe the injury in the IRW. (Defs.' Brf. at 13.) As a threshold matter, whether the survey accurately describes the injury is an issue for the trier of fact, upon consideration of all relevant evidence. The State's natural science experts have opined as to the injury in the IRW. Not surprisingly, Defendants disagree.[14] To adopt Defendants' argument that the CV survey does not accurately describe the injury to the IRW would be to prematurely decide factual issues in favor of Defendants.

In formulating the survey's injury description, however, the Stratus team relied on the

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[12] Defendants' expert, Dr. Desvousges, has used counterfactuals in applications of stated preference methods. *See, e.g.*, Wood, et al., *How Much Are Customers Willing to Pay for Improvements in Health Care and Environmental Quality*, The Electricity Journal (May 1995); Desvousges et al., *Measuring Nonuse Damages Using Contingent Valuation*, Research Triangle Inst., Monograph 92-1 (1992); Desvousges, et al., *Lower Fox River and Green Bay: Assessment of Recreational Fishing Losses and Restoration Offsets*, Triangle Econ. Research (Nov. 2000).

[13] Defendants also overreach in stating the State's "remediation expert, Todd King, rejected alum as a viable treatment option" (Defs.' Brf. at 11) – an issue they previously raised when they unsuccessfully moved to strike the CV Report. (Dkt. #1950.) As explained then, the remediation experts did *not* reject the potential use of alum for all purposes. (Dkt. #1987 at 3-7.)

[14] Defendants repeatedly rely on the Connolly-Sullivan-Coale Report (which the State has moved to strike on various grounds), in disputing the CV survey's injury description.

opinions of the State's natural scientists.[15] Dr. Bishop, one of the Stratus experts, had primary responsibility for liaising with the State's natural scientists and ensuring that the survey conveyed that information in language that respondents could understand. (Dkt. #2272-5, Bishop Dep. at 94:19-95:6, 96:11, 97:22-98:1.) Dr. Bishop is well qualified to make such judgments based on more than 30 years as a researcher on valuation, working extensively with natural scientists in interdisciplinary work. (*Id.* at 98:8-19.) Dr. Bishop testified that he communicated about the injury with Drs. Engel, Wells, Stevenson, Cooke, Welch, and Olsen, and other CDM employees as well. (*Id.* at 100:19-23; *see id.* at 99:2-12.) Although Defendants seem to question the Stratus team's processing the information from the natural scientists and summarizing it in terms that would be understood by the respondents (Defs.' Brf. at 15), this is standard CV practice in studies relating to the environment, which are inherently interdisciplinary.

Defendants misleadingly claim on page 13, and elsewhere, that "the results of the Stratus intercept and telephone surveys demonstrated that most users thought the water quality was good." As Defendants know, Stratus conducted an intercept study in the Summer 2006 as part of a preliminary investigation. (Ex. T, Chapman Dep. at 32:24-33:7, 36:8-37:1, 38:13-15, 39:13-25.) It was taken of a *non-representative sample* of visitors to the IRW. (*Id.* at 53:5-12.) Stratus also conducted a telephone survey as part of its preliminary investigation. (*Id.* at 64:3-5, 65:20-66:1.) Neither the intercept study nor the telephone survey was designed to or intended to elicit the same information as the CV Study or to be used in producing a reliable damages estimate.

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[15] As reported, "[t]he Team worked closely with the state's natural scientists to ensure the injury descriptions developed for the two questionnaires were consistent with their findings. The Team also drew on experts reports written by Engel (2008a, 2008b, 2008c), Stevenson (2008a, 2008b, 2008c), Wells et al. (2008a, 2008b), Cooke and Welch (2008a, 2008b), and Fisher (2008)." (Dkt. #1853-5, CV Report, p. 3-2.)

Nevertheless, Defendants seek to put more weight on this preliminary work than the CV study, which *was* intended and carefully designed for this purpose. Moreover, even if some current visitors characterize water quality in the river and lake as "good," that says nothing about whether it is degraded, whether current non-users no longer visit because of the deterioration, and whether visitors would enjoy it more if water quality improved.

Defendants also cite various comments by one of the Stratus team's peer reviewers, Dr. Kerry Smith. (Defs.' Brf. at 13-14.) Defendants take these quotations out of the overall peer review context. As Dr. Bishop testified, Dr. Smith's comments arose in the context of suggesting ways in which the survey might be improved; it did not represent his final view on the survey's validity or reliability.[16] (Dkt. #2272-5, Bishop Dep. at 142:12-143:15.)

Defendants' specific claims of "inaccurate statements" are addressed in turn below.

Bullet Point #1 (p. 14). Contrary to Defendants' assertion, the quoted survey language makes clear that the water is "sometimes" murky in the summer, i.e., not "often" or "always" murky in the summer, and not murky from algae during the rest of the year. The State's expert, and natural scientist, Dr. Stevenson, found that: "Based on this range of conditions, waters were usually relatively clear with less than 1.45 µg chlorophyll a/L, but would sometimes be murky with chlorophyll as high as 20 µg/L." (Dkt. #2278-4, Stevenson Report, p. 22.) This finding by Dr. Stevenson, and the challenged statement in the survey, are entirely consistent. Both stated that the water is "sometimes" murky.

Bullet Point #2 (p. 14). Dr. Bishop discussed the challenged survey language with Dr.

[16] Dr. Bishop also explained that as the review process proceeded, the team had at least one phone conversation with Dr. Smith, who "was satisfied that there was not a weakness where he thought there might be one." (Dkt. #2272-5, Bishop Dep. at 143:10-13, *see also id.* at 142:5-143:15, 156:1-157:20.) The team also devised ways to improve the survey to address his concerns. (*Id.* at 142:1-7.)

Stevenson at length on several occasions. Stevenson agreed that it is consistent with his results.

Bullet Point #3 (p. 14). Here, Defendants disregard the fact that the lack of habitat for smallmouth bass and other types of fish is one of the most important conclusions of the State's experts Drs. Cooke and Welch, who stressed it repeatedly in their report and in conversations with Dr. Bishop. Drs. Cooke and Welch also vetted the language used in the survey that describes this conclusion. With regard to Defendants' statement that the survey "fails to mention that it is a 'premier' fishery," the survey states: "Some types of fish, such as largemouth bass, have increased in numbers and are growing more quickly." (Dkt. #1853-5, CV Report, p. A-11.) Moreover, the citation from *Field and Stream* does not refer to Tenkiller as a "premier" fishery. It mentions that the area around Tahlequah includes "prime largemouth bass fishing lakes (like Tenkiller to the south, and Gibson to the northwest)," but also mentions other fishing opportunities in the region.

Bullet Point #4. The language quoted from the survey does not imply that visitation has been affected, nor were there indications in the focus groups, one-on-one interviews, or the survey results that subjects interpreted it in this way. Moreover, one page later, the survey states: "During the years since around 1960, people have continued to visit the river and lake …." (Dkt. #1853-5, CV Report, p. A-9.) The Cooke and Welsh Report states that "Tenkiller was borderline oligotrophic-mesotrophic in 1974-1975. Amounts and types of algae in 1961, 1974 and 1975 were those of oligotrophic reservoirs." (*See id.* at 1; *see also id.* at 29.) In discussions with the Stratus team, they confirmed that water clarity of 10 feet would be expected in an oligotrophic reservoir and that this level of visibility is exhibited by Broken Bow Lake, which they consider to be comparable to Tenkiller, except that Broken Bow has less phosphorus. The modeling work of Drs. Engel and Wells also supports this view. Thus, the survey's description is consistent

with the opinions of the State's injury experts.

Defendants cursorily state that the survey's use of photographs was misleading.[17] (Defs.' Brf. at 15.) Without challenging any particular photograph, they argue that "the photographs are not representative of conditions in the Watershed on a year-round basis." (*Id.*) Indeed, they were not represented to be. Furthermore, the photographs were carefully pretested. (Dkt. #1853-5, CV Report, p. 3-4.) And the photos ultimately used were chosen to display relatively mild illustrations of water transformation, rather than more extreme versions. (*Id.*, p. 3-12.)

### D. Defendants' Argument That the Survey Did Not Measure Damages Caused by Defendants Is a Red Herring

On page 16, Defendants complain that the Stratus team "estimate[d] total natural resource damages in the Watershed, regardless of the source of the phosphorus and made no attempt to calculate damages caused by the Defendants" and that as a result, "Stratus' opinion regarding estimated damages is irrelevant to the [State's] claims." (Defs.' Brf. at 16.) This argument is without merit. Defendants do not cite any authority for their notion that a CV study should allocate the damages estimate among PRPs. To do so would contravene principles of joint and several liability, which is the legal basis for the State's claims giving rise to natural resource damages. (*See* Complaint: Counts Two (CERCLA NRD); Four (state law nuisance); Five (federal common law nuisance); Six (Trespass); Seven (state statutory law).)

### E. The CV Survey Is Reliable

#### *1. The Design of the CV Survey Is Reliable*

Defendants first challenge the survey's design. In addition to rehashing their position on the survey's injury description and alum scenario (addressed *supra* Section III.B and C), Defendants claim that the CV survey did not follow "several key recommendations of the NOAA

[17] Defendants' reliance on one participant's comments during the survey development stage is hardly support for their broad claim that the final survey's use of photographs was misleading.

Panel." (Defs.' Brf. at 17.) As the others, this argument falls short.

As an initial matter, in setting forth the NOAA Panel Guidelines, the NOAA Panel stated that a "CV survey does not have to meet each of these guidelines fully in order to qualify as a source of reliable information to a damage assessment process." (Ex. F, p. 29.) In any event, the CV Report provides a comprehensive description of how the CV survey satisfies 21 out of the 22 applicable guidelines (of which there are 25 total). (*See* Dkt. #1853-5, ch. 3.8; Ex. N, App. H.)

Defendants' experts acknowledge the CV survey met these NOAA Guidelines: (1) personal interview; (2) reporting; (3) elicitation format; (4) referendum format; (5) reminder of undamaged substitute commodities; (6) cross tabulations; (7) steady state or interim losses; (8) present value calculations of interim losses. (Dkt. #2272-8, D/R Report, pp. 81-83.) They also admit the "temporal averaging" guideline does not apply. (*Id.*, p. 82.) The survey's compliance with the remaining guidelines (*see* Ex. F, NOAA Report) is summarized below.

| **NOAA Guideline** (Citation to NOAA Panel Report) | **Comments** |
|---|---|
| **Sample Type and Size** (pp. 30, 46) | The CV survey satisfies this guideline. (Ex. N, CV Report, App. H, p. H-3.) The guideline recommends the guidance of a professional sampling statistician. Dr. Tourangeau served this role and was supported by sampling experts at Westat as well. (*Id.*, p. H-3.) Defendants' experts claim that this guideline is not well-taken (Dkt. #2272-8, Desvousges/Rausser ("D/R") Report, p. 81) because the NOAA Panel never mentioned relative sample sizes for base and scope surveys. |
| **Minimize Nonresponses** (pp. 30, 47) | The CV survey satisfies this guideline. (Dkt. #1853-5, CV Report, ch. 5; Ex. L, App. F; Ex. N, App. H, p. H-4.) The issue of the survey's response rate is also discussed in detail *infra* Section III.E.3. |
| **Pretesting for Interviewer Effects** (pp. 30, 49) | The CV survey satisfies this guideline. The NOAA Panel calls for pretests to assess whether the presence of an interviewer makes a difference on the answers. Stratus "evaluated this issue during the hotel pretests [which used a form of self-administration]. . . . The team found little evidence that the proportion of respondents voting in favor of the program was systematically lower in hotel pretests than in other settings." (Dkt. #1853-5, CV Report, p. 3-13.) This conclusion is also consistent with the literature cited on page 3- |

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| | 14 of the CV Report. (*See also* Ex. N, CV Report, App. H, p. H-6.) |
| **Careful Pretesting of a CV Questionnaire** (pp. 31, 51) | The CV survey satisfies this guideline. (Ex. N, CV Report, App. H, p. H-8.) Chapter 3 of the CV Report summarizes the focus groups, cognitive interviews, small sample pretests, and formal pilot studies conducted as the team designed and refined the base and scope instruments. The team reported that "in our experience no other study has undergone such extensive pretesting." (*Id.*, App. H, p. H-8.) Defendants' experts' position that this guideline is not met (Dkt. #2272-8, D/R Report, p. 82) is not well-taken, as the NOAA Panel was silent about how pretest results should be reported, and as a practical, all documentation about changes to the questionnaire and bid levels was provided to Defendants. (They relied on this evolution in creating their Tables 5.18a and 5.18b, pp. 112-13 (Dkt. #2272-8, pp. 112-13).) Moreover, Defendants' experts cite to a research proposal in Smith (2007), which is obviously not the NOAA Guidelines. |
| **Conservative Design** (pp. 32, 52) | The CV survey satisfies this guideline. The Stratus team took the many steps described on pages 3-11 to 3-13 of the CV Report (Dkt. #1853-5) and pages H-9 to H-10 of Appendix H thereto (Ex. N) to implement conservative design. |
| **Accurate Description of the Program or Policy** (pp. 32, 53) | The CV survey satisfies this guideline. The team developed information that was clearly and objectively presented and complete enough to allow respondents to make informed choices. (Ex. N, CV Report, App. H, p. H-13.) |
| **Pretesting of Photographs** (pp. 33, 55) | The CV survey satisfies this guideline. Substantial time was spent during focus groups in exploring what the photographs communicated to participants. (Ex. N, CV Report, App. H, p. H-14.) |
| **Adequate Time Lapse from the Accident** (pp. 33, 55) | This guideline, concerned with isolated accidents, does not apply. (Dkt. #1853-5, CV Report, App. H, p. H-16.) Defendants' experts' view that this guideline is not satisfied because, among other things, they have no basis upon to which to opine that "media coverage has increased awareness of the algae conditions over the last year" (Dkt. #2272-8, D/R Report, p. 82) and rely on non-representative sample surveys to opine on the public as a whole. |
| **"No-answer" Option** (pp. 34, 57) | The CV Report explains why the Stratus experts thoughtfully considered, but rejected, including a "no-answer" option (different from a "no" answer"). (Dkt. #1853-5, CV Report, p. 3-18; *see also* Ex. N, App. H., p. H-18.) "Since the NOAA Panel issued its recommendation on this point, scholars have produced a substantial body of research that indicates that the NOAA Panel's assumptions about 'no-answer' responses were only partly correct. In fact, a different approach to addressing the Panel's concerns is preferable for application in CV surveys." (Dkt. #1853-5, p. 3-18.) They further cite two literature reviews in support of their conclusion. (*Id.*) |
| **Yes/no Follow-ups** (pp. 34, 57) | The CV survey satisfied this guideline. (Dkt. #1853-5, CV Report, p. 3-15 & App. H, p. H-19.) Immediately after respondents voted, they were asked open-ended questions about why they voted for or against the program or why they did not know how they wanted to vote. Answers were recorded and analyzed. (*Id.*, p. 3-15.) Defendants' experts' position that this |

| | |
|---|---|
| | guideline is not met is without merit, as they present a view on how responses should be used in the analysis not advocated by the NOAA Panel. (Dkt. #2272-8, D/R Report, p. 83.) |
| **Checks on Understanding and Acceptance** (pp. 35, 58) | The CV survey satisfies this guideline. (Dkt. #1853-5, CV Report, p. 3-16 (describing process); Ex. N, App. H, p. H-27.) Using the focus groups, one-on-one interviews, hotel pretests, and pilot surveys, the Stratus team put a great deal of effort into making the questionnaire understandable and acceptable to respondents, and several questions were included to gauge understanding. (Dkt. #1853-5, ch. 3.) |
| **Alternative Expenditure Possibilities** (pp. 35, 59) | The CV survey satisfies this guideline. (Dkt. #1853-5, CV Report, p. 3-17; Ex. N, App. H, p. H-28.) The NOAA Panel recommended reminding respondents of other possible expenditures, including those on other environmental goods. The CV survey respondents were reminded before they voted that they might prefer to spend their money on other issues, environmental or otherwise, and to keep in mind how much their household could afford to pay. (Dkt. #1853-5, p. 3-17) |
| **Deflection of Transaction Value** (pp. 36, 60) | The CV survey satisfies this guideline. The team reported that the debriefing questions in the survey confirmed their success in deflecting "warm glow" effects and that survey language deflected dislike of "big business." (Ex. N, CV Report, App. H, p. H-29.) |
| **Advance Approval** (pp. 36, 63) | This guideline does not apply, as it was infeasible to have Defendants pre-approve the CV survey. (Ex. N, CV Report, App. H, p. H-32.) |
| **Burden of Proof** (pp. 37, 63) | The CV survey satisfies this guideline, which provides that the "burden of proof of reliability must rest on the survey designers." (Ex. N, CV Report, App. H, p. H-33 (discussing compliance).) |
| **Scope Test** | The CV survey satisfies this guideline. The scope test was an integral part of the Study, and the data confirmed responsiveness to a scope effect. (Ex. N, CV Report, App. H, p. H-2.) |

In sum, the Stratus team worked tirelessly to ensure that the NOAA Panel Guidelines were followed, resulting in a survey with the recommended indicia of reliability contemplated by the NOAA Panel. Thus, the CV Study produced a damage estimate reliable for use in this case.

### *2. Stratus' Data Analysis Followed Sound Methodology*

Defendants claim Stratus' data analysis renders the estimate unreliable, stating:

> Converting Respondents' answers into an average willingness to pay [WTP] value requires significant data manipulation using complex econometric principles. The results are sensitive not only to the way in which answers are 'coded' (i.e., how a Respondent's open ended answer is translated into a numerical value), but also to the statistical methods employed to process the coded results.

(Defs.' Brf. at 18.) Each part of this statement is misleading. The answers of individual

respondents were *not* converted into an individual average WTP. The basic referendum question used was *not* open-ended and did *not* have to be translated into a numerical value. Instead, the Stratus team computed the percent of the respondents voting yes at each bid amount; then applied a straightforward non-parametric method to calculate the *overall* average WTP for the population of Oklahoma (*not* the WTP of an individual). (Dkt. #1853-5, CV Report, p. 7-5.)

Defendants also claim without any supporting citation that "proper survey methodology required Stratus to determine whether to discard or discount a Respondent's answer" under various conditions. (*Id.*) Proper survey methodology emphatically does *not* countenance discarding most of the data from a survey. *See, e.g.*, Robert M. Groves, et al., Survey Methodology, ch. 10 (2004). Although Defendants claim that their experts "illustrate the sensitivity of the study's damages estimate by eliminating individuals" who met various conditions (Defs.' Brf. at 19), they did not in fact simply drop such individuals, they *changed* such respondents' votes from yes to no. Not surprisingly, they changed the result. It is *not* proper survey methodology to change data arbitrarily and in such a wholesale fashion. Moreover, the arbitrary nature of the purported "sensitivity" analysis carried about Desvousges/Rausser is apparent from the fact that *all* of the changes they made changed "yes" votes to "no" votes and did not change any votes from no to yes when respondents were uncertain, etc. By contrast, when the Stratus team did a careful statistical analysis of what would have happened if all respondents had accepted all key features of the scenario (and were certain of their answers), they found that WTP actually went up. (Ex. M, App. G (reporting results).)

### *3. There Is No Evidence of Nonresponse Bias*

Defendants next claim that "the CV Survey is unreliable due to non-response bias."[18]

[18] "[N]onresponse can introduce distortions that make the sample unrepresentative of the larger population." (Ex. L, CV Report, App. F, Page F-1.)

(Defs.' Brf. at 19.) Defendants assert that the CV Survey's "55% response rate is substantially below the rate recommended by both NOAA (70%) and the [OMB] (80%)."[19] (*Id.*) Neither "recommends" a specific response rate, however. With regard to NOAA, neither Defendants' Motion nor the Desvousges Report cited therein identifies any NOAA document recommending a 70% response rate.[20] (*See id*.) In fact, the NOAA Report does not identify a threshold response rate and instead calls for "minimizing nonresponses." (Ex. F, p. 30.) Here, the Stratus team took appropriate steps to minimize nonresponse. (Ex. L, CV Report, App. F.)

Moreover, OMB did not recommend a response rate of 80%, but instead recommends the following: "Plan for a nonresponse bias analysis if the expected unit response rate is below 80 percent . . . ." (Ex. I, Guideline 1.3.4, OMB Standards and Guidelines for Statistical Surveys (2006), p. 8; *see also id.*, Guideline 3.2.9, p. 16.) In other words, when a survey response rate falls below 80%, OMB recommends that researchers investigate *whether nonresponse bias exists*.[21] One possible inquiry provides: "Comparison of the respondents to known characteristics of the population from an external source can provide an indication of possible bias, especially if the characteristics in question are related to the survey's key variables." (Ex. I, OMB Guideline 3.2.9; *see also* Ex. J, OMB "Questions and Answers When Designing Surveys for Information Collections" (Jan. 2006), p. 65 (suggesting same).) Another proposed inquiry is to "assess potential nonresponse bias by analyzing differences between respondents and initial

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[19] Defendants' introductory statement that "[a]pproximately 45% of the selected sample refused to participate in the survey" (Defs.' Brf. at 19) is also incorrect. Refusal to participate was only one contributor to nonresponse. (*See* Ex. J, CV Report, App. C, Table 10-1.)

[20] The Desvousges/Rausser Report cites an *article* (written by Kerry Smith, who was not a member of the NOAA Panel) for the assertion that NOAA recommends a 70% response rate. (Dkt. #2272-8, p. 78.) The D/R Report does *not* cite the NOAA Report, which makes no such recommendation. (*Id.*)

[21] Defendants suggest without authority that the mere fact of survey nonresponse necessarily demonstrates the *presence* of nonresponse bias, instead of just the *possibility*.

refusals (who were later 'converted') or conduct analyses of key estimates by levels of effort to obtain the response . . . ." (Ex. J, p. 66.) Here, the Stratus team conducted both of these assessments of nonresponse bias, which yielded no evidence of nonresponse bias, as reported. (Dkt. #1853-5, CV Report, p. 5-16; Ex. L, CV Report, App. F.)

Finally, Defendants' experts carried out no analysis themselves, and Defendants present *no* evidence in support of their claim that nonresponse bias exists in the CV survey.[22]

***4. Error Rate***

Defendants improperly claim that "the CV survey is unreliable because Stratus cannot establish an error rate." (Defs.' Brf. at 19.) CV satisfies the consideration of "known or potential rate of error," *Daubert*, 509 U.S. at 594, because statistical error can be examined in CV studies by calculating confidence intervals. The CV Report follows standard practice in reporting a confidence interval around its lower bound estimate of the mean damages per household. (Dkt. #1853-5, p. 7-5.) Calculations of this type are standard practice in economic estimation (and the social sciences), are not unique to CV, and make known the error rate of CV.

Defendants' arguments to the contrary are unavailing. First, they contend "Stratus has not attempted to establish an error rate due, in part, to the fact that it is impossible to externally validate the results of [CV] studies that estimate nonuse values." (*Id*. at 20.) The NOAA Panel expressly addressed, and rejected, the issue of external validation, pointing out that it "is not special to the CV approach" and inheres in any method of measuring non-use values. (Ex. F, NOAA Report, p. 7.) Obviously, the issue did not prevent the Panel's endorsement of CV.

Second, Defendants' assertion that the Stratus team "could have attempted to validate the use value component of their results with actual visitation data and use information (including

[22] Indeed, Defendants' expert Dr. Desvousges acknowledges that (1) he did not analyze the survey data to conclude that nonresponse bias exists in the CV survey and (2) he has no quantitative evidence to support such a claim. (Dkt. #2270-7, Desv. Dep. at 92:12-17, 93:8-11.)

their own intercept and telephone surveys), but they chose not to do so" is simply not correct. (Defs.' Brf. at 20.) Such an exercise would fail to address non-use values, and the intercept and telephone surveys did not address individuals' valuation of the change in water quality.

Third, Defendants' claim that the survey results are inconsistent with standard economic principles such as demand elasticity and income elasticity is flawed. (*Id.*) For this argument, Defendants rely exclusively on their experts' Desvousges/Rausser Report. The State has moved to exclude, among other things, the opinions therein relating to income and price elasticities because Desvousges/Rausser committed several errors in their estimations, failed to report confidence intervals on their estimations, and fail to support their approached with references to peer-reviewed literature, among other deficiencies. (*See* Dkt. #2270, pp. 22-24.) That discussion is incorporated by reference. Thus, Defendants' argument is without foundation.

**F. The Past Damages Report Satisfies *Daubert***

The Past Damages Report presents a reliable damages estimate. Defendants incorrectly state: "Plaintiffs estimated past damages by simply taking the damages estimate from the [CV] survey, multiplying it by 27 (the number of years from 1981-2008), and including compound interest at a rate of 3.83%." (Defs.' Brf. at 21.) In fact, no number was multiplied by 27, nor was the value per household from the CV Study simply multiplied by a number. The value of future damages per household of $184.55 from the CV Study served only as the starting point of the benefits transfer exercise in the Past Damages Study, which followed the five steps to benefits transfer set forth in the EPA's peer-reviewed "Guidelines for Preparing Economic Analyses" (EPA 2000). (*See* Ex. O, Past Damages Report, pp. 9-10.) This value was adjusted for the number of years of past damages compared to future damages and for compound interest, as required by standard economic principles. Furthermore, past and future injury levels and changes in income and willingness to spend money on the environment over past years also were

appropriately accounted for. This process resulted in an estimate of past damages per household of $118.11, then multiplied by the number of households in 1980. (*Id.*, pp. 4, 7.)

Defendants claim that benefits transfer does not involve "extrapolation of the value over a large time period." (Defs.' Brf. at 21.) Yet, the refereed literature supports the transfer of benefits over time. *See, e.g.*, V. Kerry Smith et al., *Benefit Transfer as Preference Calibration* 2 (Resources for the Future Discussion Paper No. 99-36, 1999); John C. Bergstrom & Paul Civita, *Status of Benefits Transfer in the United States and Canada: A Review*, 47 Can. J. Agric. Econ. 79 (1999); Dkt. #2272-5, Bishop Dep. at 134:3-11. Moreover, the approach is frequently used to transfer studies back in time. For example, in the 1990s, the EPA did a comprehensive, retrospective benefits transfer study (going back over 20 years) to evaluate the benefits of the Clean Air Act. *See* U.S. EPA, *The Benefits and Costs of the Clean Air Act, 1970 to 1990* (1997), *available at* http://www.epa.gov/air/sect812/copy.html. In that peer-reviewed study, the researchers transferred through time values developed between 1979 and 1996 to estimate the benefits of reducing injuries between 1970 and 1990. *Id.* at 43; *see generally id.* at app. i.

Defendants' expert Dr. Desvousges has applied benefits transfer over time in the NRDA context. Dr. Desvousges and a co-author estimated recreational fishing losses due to mining waste contamination for 1992-93. W. H. Desvousges and S. M. Waters, *Report on Potential Economic Losses Associated with Recreation Services in the Upper Clark Fork River Basin,* Triangle Economic Research, July 13, 1995. Then, in what reflects a benefits transfer comparable to that done here, they transferred values back to 1981 and forward to 2000. In addition, Dr. Desvousges has transferred recreational fishing benefits estimated in the year 1998 to the past, as far back as 1981 (27 years) and as far forward in the future as to 2050. *See* William H. Desvousges et al., *Lower Fox River and Bay of Green Bay: Assessment of Potential*

*Recreational Losses and Restoration Offsets* (2000) (Dkt. #2270-28).

While it is true that errors can be significant in this context where the study site and the policy site are *different* (i.e., where there are differences between geographical locations, the environmental resources, and the population groups), errors of the magnitude cited by Defendants are much less likely where, as here, the study site and the policy site are *the same*. (Ex. O, p. 2; *see also* Dkt. #2272-5, Bishop Dep. at 134:18-24.) The experts also noted that available evidence, reviewed in the Study, shows that there have *not* been substantial changes in incomes or attitudes toward environmental spending during the relevant period. (Ex. O, pp. 4-6.)

Defendants also complain that the authors of the Past Damages Report (Dr. Hanemann, Dr. Bishop, and Mr. Chapman) were required to make numerous assumptions about water quality, WTP, and individual preferences over time. (Defs.' Brf. at 22.) As reported, however, these experts evaluated a number of factors that may have influenced WTP through time, such as changes in overall income levels, environmental attitudes towards the environment, and relative size of the injury. (Ex. O, Past Damages Report, pp. 3-6.) In each of these cases, either no adjustments to WTP through time were warranted or in the case of income levels, any change would have slightly *increased* WTP (and resulting damage estimates), and, therefore, the State's experts chose a conservative approach and did not undertake the adjustment. (*Id.* at 3-5, 9-10.)

In addition, Defendants' claim that the past damages estimate is not relevant because of changes in phosphorous loading (Defs.' Brf. at 22) ignores principles of joint and several liability underlying many of the State's claims. And because the Past Damages Report draws reliable and relevant information from the CV Study, Defendants' argument to the contrary is a non-starter.

## IV. CONCLUSION

Based on the foregoing, the Court should deny Defendants' Motion (Dkt. #2272).

Respectfully Submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on this 7th day of July, 2009, I electronically transmitted the above and foregoing pleading to the Clerk of the Court using the ECF System for filing and a transmittal of a Notice of Electronic Filing to the following ECF registrants:

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